Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	MM Docket No. 99-25
Creation of a	)	
Low Power Radio Service	)	

TO: The Commission

COMMENTS OF THE ADVENTIST RADIO NETWORK, INC.

Adventist Radio Network, Inc. ("ARN"), by counsel, hereby submits its comments in response to the FCC's Notice of Proposed Rule Making ("NPRM"), FCC 99-6, released February 3, 1999 in the above-identified proceeding.

ARN is a nonprofit association whose 19 members in the United States are the owners and/or operators of 26 FM stations, 2 AM stations and 16 FM translator stations. ARN members are institutions affiliated in various ways with the Seventh-day Adventist Church, or are other private entities owned or controlled by individuals who are members of the Seventh-day Church. A listing of the member stations appears in Appendix B.

The Commission proposes to establish a new low power FM service featuring three new classes of FM stations, operating with effective radiated power of 1,000 watts, 100 watts and 10 watts, respectively. To accommodate a greater number of such stations in the existing FM band, the Commission proposes to permit these new low power stations to be established and maintained without the need to protect other stations on 2nd and 3rd adjacent channels as now is

required of all other stations by the Commission's rules. The Commission seeks public comment on a wide range of questions affecting the technical and legal aspects of such a service.

ARN endorses the efficient and effective use of the spectrum to provide the highest level of service to the public which is feasible. If there are potential new station operators who have something significant to contribute to the public discourse and who are not able to establish themselves on the air under the current regulatory and business regimes in the radio industry, it may be in the public interest to modify those regimes to foster the development of such new stations and operators.

However, such opportunities for new entrants into the field of radio broadcasting should not come at the expense of the technical integrity of the existing system which is already providing the American public with a wide array of existing service. Nor should a new low power FM service be allowed to displace existing services which broadcasters have constructed and operated in good faith at considerable expense. Accordingly, ARN would support a plan for the development of low power radio only if it is somewhat modified from that proposed by the Commission in the NPRM.

ARN opposes the Commission's proposal to allow LPFM stations to locate themselves without regard to the conventional criteria for protecting other stations on 2nd and 3rd adjacent channels. At a time when spectrum on the FM band is becoming increasingly congested and when prospects abound for the increased use of the margins of the ordinary FM channel, the proposal to abandon adjacent channel protection for LPFM is ill-advised.

Attached in Appendix A is an Engineering Statement which demonstrates the technical havoc that could result to the existing patterns of service provided by existing stations if new

stations, albeit low powered ones, were permitted to encroach upon their established service areas. Three ARN member stations were selected to illustrate the problem: WSMC, Collegedale, Tennesee; WAUS, Berrien Springs, Michigan; and KEEH, Spokane, Washington. The discussion of the prospects for interference to the signals of these three stations is intended to be illustrative only — and NOT a comprehensive survey of the sum of the hazards that would face the collective membership of ARN if the proposal for relaxed separation criteria were to be adopted.

Hypothecating LPFM stations on second adjacent channels to each of these stations with the separations proposed in the NPRM as feasible, ARN found very disturbing data. A 1000-watt LPFM station near WSMC could cause what is now considered to be objectionable interference to an area with a population of 30,012 within WSMC's 60 dBu contour. A similarly placed 100-watt LPFM station would cause interference over an area whose population is 5,407. At the right site, a 1000-watt station could interfere with the reception of WAUS in an area within its 60 dBu contour inhabited by 6,470 people. Within the KEEH 60 dBu contour, some 3,134 members of the public could be precluded from clear reception of that station.

Such prospective loss of service by so many people is unacceptable. Those listeners have come to rely upon and expect service from the existing stations. Conversely, the station operators have invested time and resources in developing the technical facilities and the programming services designed to serve at least all of the population within a station's 60 dBu contour. To upset those apple carts in mid-stream would unjust to both the audiences and the broadcasters. The theoretical benefit which might result from allowing untested new operators to impinge upon existing services is too ephemeral to justify the disruption that would ensue.

There may be benefit to establishing a new LPFM service much as proposed in the NPRM. But if such a service is to be developed, it must be developed outside of the geographic and spectrum spheres of utility for existing stations. The public interest demands that existing channels of proven service — which are used and relied upon by millions — not be sacrificed for an untried experiment in community radio which may or may work.

Respectfully submitted,

ADVENTIST RADIO NETWORK, INC.

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Its Attorney

August 2, 1999

APPENDIX A

Attached here as Appendix A is the Engineering Statement of consulting engineer Doug Vernier.

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Telecommunication Consultants

Engineering Statement:

Under the "Creation of a Low Power Radio Service" proposal, Docket 99-25, the Federal Communications Commission proposes a new radio service that would assign low power FM channels on the basis of a table of minimum separations. The FCC's table assumes the 2nd and 3rd adjacent protections will be dropped between low power stations and the Commission asks whether the 2nd and 3rd adjacent channels should be dropped between LPFM and other stations.

The Commission states a belief that modern receivers are better capable of rejecting the interference. However, since the Commission has not undertaken scientific studies of modern FM receivers, such a belief is conjecture at best. The current U/D ratios used by the Commission were first adopted for use in 1947. While receiver selectivity may have improved since that time, with the advent of Docket 80-90 and the growth in the number of stations in the non-commercial band, there are now many more stations on the air than in 1947 improving the chances for interference. Adoption of section 73.215 allowing stations to use shortspace and directional antennas and contour protection has also lowered the potential interference threshold. Adding a new low power service while dropping the 2nd and 3rd adjacent protections clearly adds to the threat.

The proposal to add a new LPFM service comes at an inopportune time. Under the1998 Biennial Regulatory Review - Streamlining of Radio Technical Rules in MM Docket No. 98-93, 98-1 the FCC has put forward a number of proposals

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which will raise the interference floor including allowing a station to "negotiate" interference by buying or selling interference rights. The Commission proposes to define all new construction permits as 73.215 proposals, therefore allowing (even encouraging) further shortspacing. The Commission has proposed to allow all applicants to improve facilities by receiving second or third adjacent interference without negotiation as long as the docket defined negotiated interference criteria are met and no interference would be caused to the service contour of any other station. In the same docket, the Commission proposes to allow the use of the U/D method rather than contour overlap. This will generally result in defining a smaller interference area even though the size of the actual interference area does not change. The Commission has proposed to reduce the minimum shortspacing distances defined under Section 73.215(e) by six kilometers. If this comes about it will mean that many stations may be operating more highly directional (and, over a period of time, less stable) antennas. The Commission has proposed a C0 class of stations which will reduce the spacing protection now given class C stations, therefore allowing more new stations to go on the air or existing stations to move closer to a protected station. Finally, the FCC proposes a new point-to-point signal contour calculation method that is supposed to be more sophisticated in the way it considers the impact of terrain. In reality however, the method as proposed produces anomalous results and is flawed. Taken together if the interference protections are relaxed, as is proposed in MM Docket 90-23, the deleterious effect of the addition of LPFM to this mix will be significant.

Since the IBOC proponents propose a modulation system which results in a large amount of radio energy being placed at the edge a station's assigned bandwidth, interference from closely spaced LPFM stations to this signal is possible, particularly if the LPFM station were allowed to operate without 2nd and 3rd adjacent channel protections.

The removal of 2nd and 3rd adjacent channel protections will have a different interference impact depending on the location of the interfering station with reference to the protected station. Based on the Commission's U/D ratios a 2nd or 3rd adjacent channel interfering station will cause a much larger area of interference when the interfering station is on or near the periphery of a given station's protected contour. Under certain circumstances it is possible for the interference area of a 2nd adjacent LPFM station to be several miles across. This is particularly likely when the FCC defined protected signal contour does not exist in reality because the method fails to consider the impact of terrain beyond 16 kilometers. While this effect is not as prominent under 3rd adjacent relationships, the 3rd adjacent interfering station is not immune to the problem.

Continuation of the FCC's current 2nd and 3rd adjacent and I.F. channel relationship protections is well advised since the system, as currently construed, provides the greatest protection over a wide variety of conditions. The proposed LPFM minimum spacing tables will result in interference caused to other full-service stations for the following reasons:

1.) The minimum separations are based on distances to protected and interference contours, calculated by the Commission's method, which fails to consider the impact of terrain beyond 16 kilometers. As a result, the FCC method may not accurately calculate the distance to a station's protected contour and because of the LPFM spacing method, interference may be caused in areas that are part of the stations' officially designated protected coverage.

2.) The LPFM minimum distance separations make the incorrect assumption that stations will transmit with the same reach in all directions. In fact, the separations only work out to prevent contour overlap when essentially flat earth is involved.

3.) If a protected station is sited against the side of a mountain, the antenna heights toward the mountain will be subtracted from the positive antenna heights in the opposite direction resulting in a significant lowering of the average antenna height. This will allow a given station to operate at a higher power for its class in the favored direction. The LPFM minimum distance spacings method is blind to this somewhat common situation.

4.) Use of the proposed table of minimum distance spacings that is particularly inappropriate because it allows the LPFM station allows an LPFM station to receive interference, but not cause it, to be closer to a protected station. This exacerbates the potential for interference that is avoided by the use of the set of minimum spacing that has been designed to avoid both incoming and outgoing contour overlaps.

5.) If both the 2nd and 3rd adjacent channel protections are dropped the possibility of intermodulation between stations increases exponentially. Considering there is the potential for ten to twenty new LPFM stations in most markets, the chances of a mix of the LPFM output frequency and an existing standard FM station is highly probable resulting in serious interference from the resultant products.

6.) Although minimum I.F. taboo spacings are listed in the proposed tables, the Commission is silent as to whether it favors applying such minimum spacings between LPFM and standard FM stations and between LPFM and LPFM stations. We believe that the I.F. spacings based on protection to the 36 mV/m contour should be applied at all times between LPFM and LPFM and LPFM and

standard class FM stations. Without such protections the LPFM service will cause serious, uncorrectable, interference.

Consequently, the Commission's LPFM proposal to drop the requirement for 2nd and 3rd adjacent channel protections and to employ a minimum spacings table is based on a flawed methodology that will result a significant increase in the interference floor of the FM band.

In attachment A, we have included three examples of how use of the proposed LPFM minimum distance spacings tables can cause significant interference to the existing stations of the commentor. In each study an LPFM channel was identified that was 2nd adjacent to the standard FM station's channel assignment.[1] The LPFM station was established at the maximum antenna height and power for LP100 and LP1000 stations.[2] Then, the Commission's FM channel U/D ratios were applied to a detailed Longley-Rice analysis using 3-arc second USGS digital terrain elevation data to define all points within the 60 dBu signal contour of the standard FM station where the 2nd adjacent ratio of +20 dB was exceeded. The area of interference was thus calculated and from that a population figure was extracted using US Census figures.

Standard Station-Market	LPFM Class	Pop in Interference Area
WSMC, Collegedale, TN	LP 1000	30,012
WSMC, Collegedale, TN	LP 100	5,407
WAUS , Berrien Springs, MI	LP1000	6,470
WAUS, Berrien Springs, MI	LP100	1,779
KEEH, Spokane, WA	LP1000	3,134
KEEH, Spokane, WA	LP100	0

[1] The shorter of the two proposed LPFM table distances was used to obtain minimum separations.
[2] Map examples show only the predicted LP1000 interference areas

A number of years ago, to combat interference on the standard broadcast band, many receiver manufacturers designed receivers with narrower I.F. bandwidths. The result lessened the effect of interference from other stations, however the more significant impact was the consequent reduction of frequency response due to the tighter I.F. bandpasses that were employed. It is very likely that receiver manufacturers will react in much the same way if the LPFM service is introduced. If an FM radio's I.F. bandwidth is reduced, distortion of the received signal will increase. Therefore, it is a likely scenario that, if LPFM stations are allowed to proliferate, the average quality of U.S. FM radio audio will drop significantly. Further, purposeful reduction of bandwidth of LPFM stations is not the answer to limiting interference. Such an activity will result in a sub-standard service with regard to audio quality on existing receivers. Other aspects of the LPFM service, including the option to allow all LPFM stations the right to receive interference, would only add to LPFM's second class citizenship.

Surveys of non-commercial educational broadcast listening show that many listeners come from areas beyond the traditionally protected 60 dBu, often to the 40 dBu. The proposed LPFM service will create many new stations, some of which will be licensed to the co and adjacent channels of such services. Using the Commission's U/D ratios, it is easy to determine that the presence of these new LPFM signals will cause interference to the reception of existing signals in areas beyond the 1 mV/m. On the average, reception of signals to the 40 dBu signal contour is adequate, *absent interference*. Therefore, the Commission should not consider the LPFM a new service in all cases. Often it will replace radio listening coverage that already exists with a signal that may not have comparable high quality programs. If the Commission decides to establish an LPFM service, one method to protect existing stations is for the Commission to consider all low power FM stations to be "secondary" and apply the provisions of Section 74.1204 (f.), which protect an existing station.

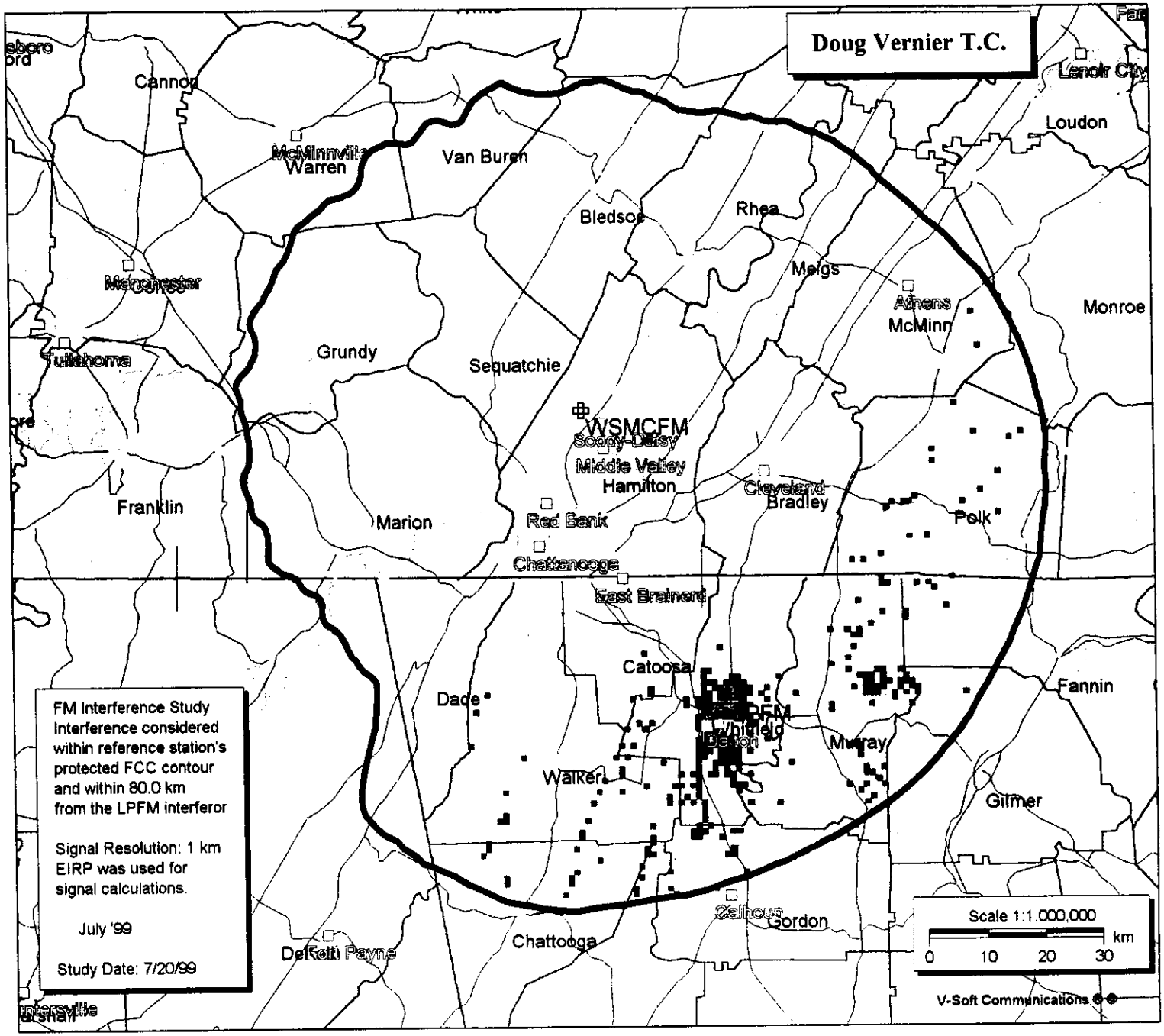
Regarding the protection of existing FM translator stations, many such translator are operated by non-commercial educational stations. If the Commission does not give careful attention to channel assignments that include the ***input*** as well as the output channels, numerous established translator stations will be forced to go off the air or find a new channel. The Commission has argued for a "new" LPFM service, however when translators are "bumped" by LPFM services the result is only a replacement of service with no assurance of improved service to the public.

Douglas L. Vernier
July 26, 1999

WSMCFM
Latitude: 35-15-20 N
Longitude: 085-13-34 W
Power: 100.00 kW
Frequency: 90.5 MHz
Channel: 213
AMSL Height: 705 m
Elevation: 549.0 m
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0040
Dielec Const: 15.0
Refractivity: 310.0
Receiver Ht AG: 9.1 m
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

WSMCFM
LPFM

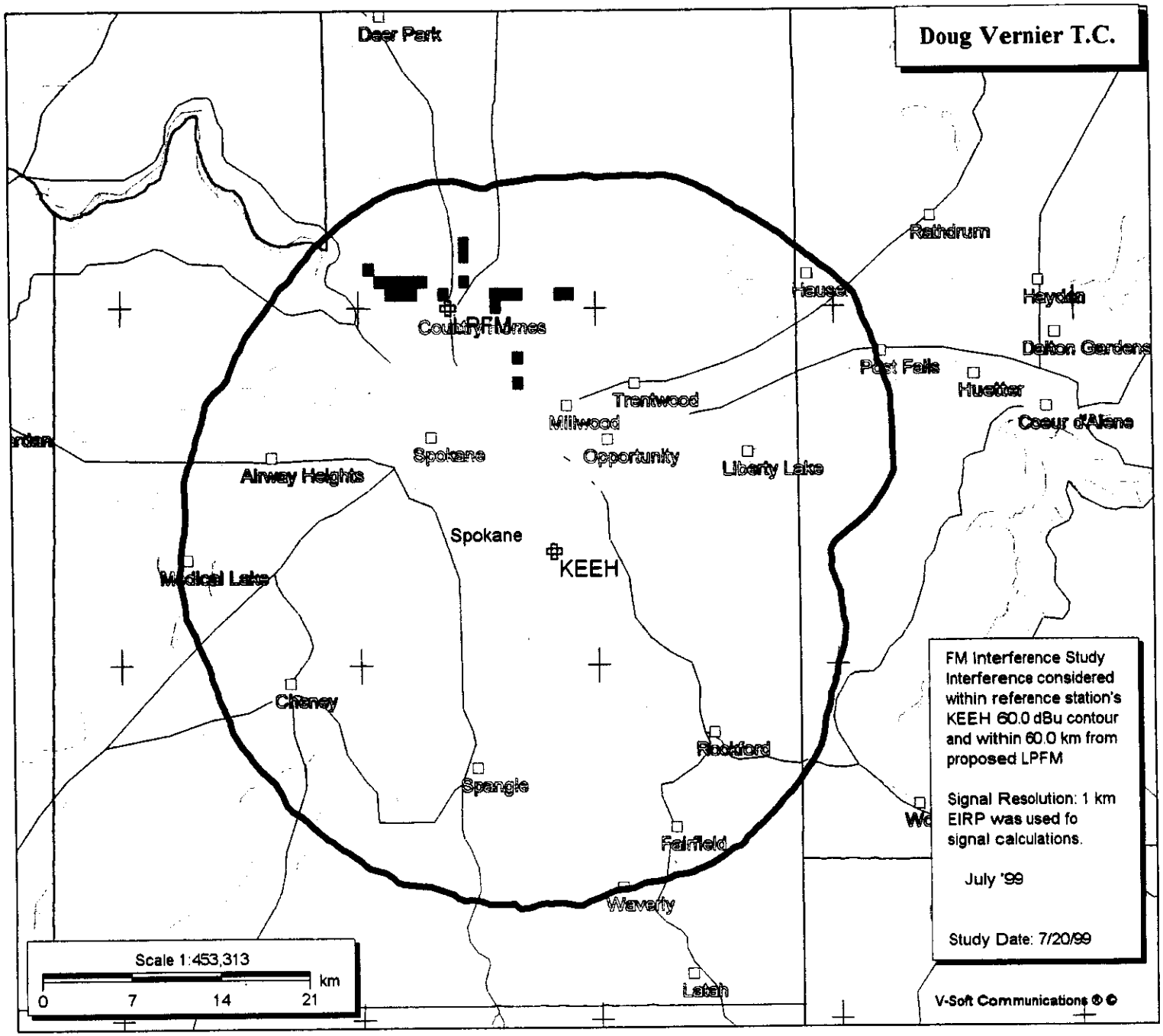
LPFM
Latitude: 34-48-45 N
Longitude: 084-57-09 W
Power: 1.00 kW
Frequency: 90.9 MHz
Channel: 215
AMSL Height: 545 m
Elevation: 243.645 m
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0040
Dielec Const: 15.0
Refractivity: 310.0
Receiver Ht AG: 9.1 m
Time Variability: 10.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast



KEEH
Latitude: 47-34-45 N
Longitude: 117-17-48 W
Power: 0.32 kW
Frequency: 104.7 MHz
Channel: 284
AMSL Height: 1138 m
Elevation: 1108.29 m
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0040
Dielec Const: 15.0
Refractivity: 310.0
Receiver Ht AG: 9.1 m
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

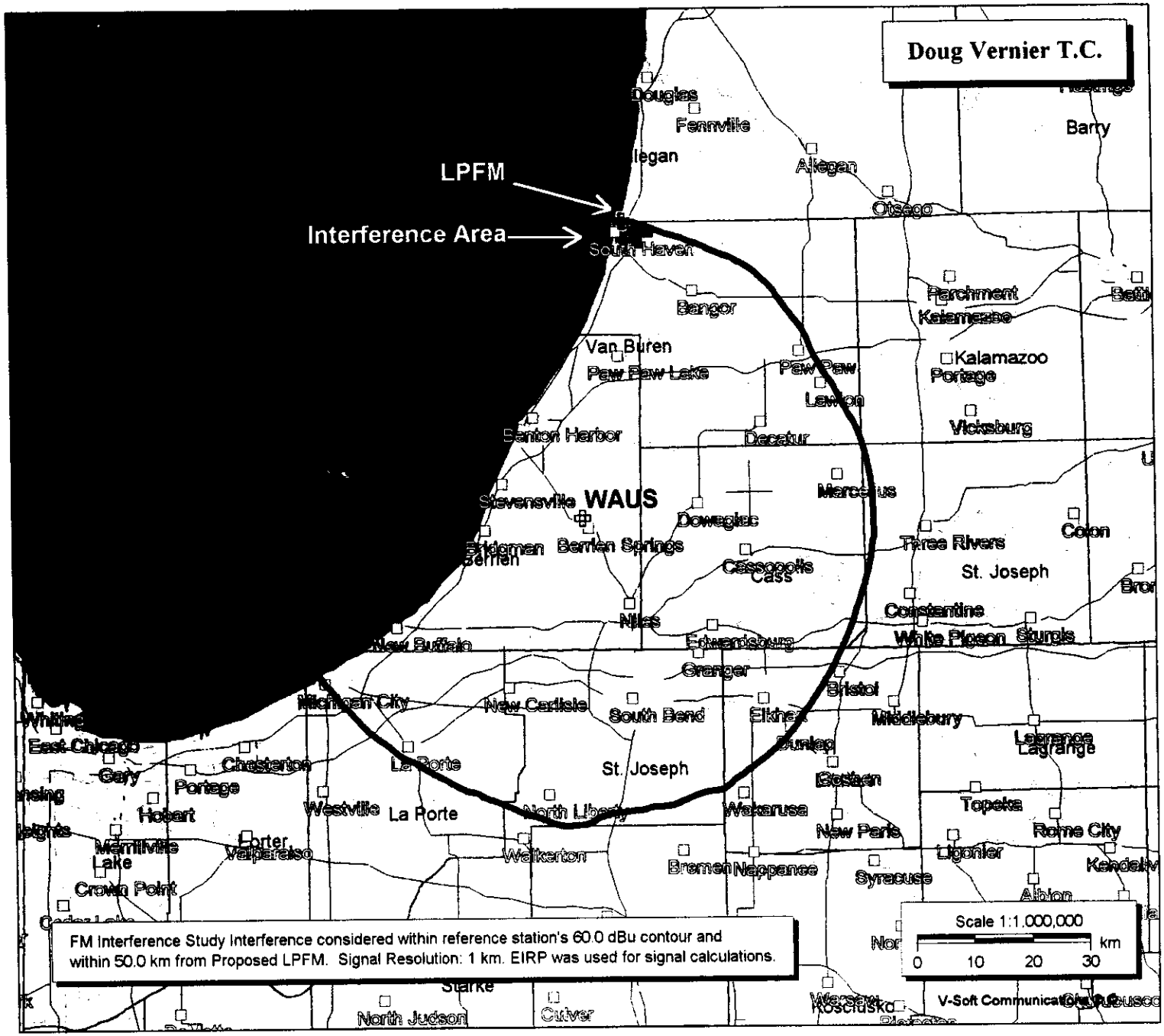
KEEH
LPFM

LPFM
Latitude: 47-45-00 N
Longitude: 117-24-20 W
Power: 1.00 kW
Frequency: 105.1 MHz
Channel: 286
AMSL Height: 687 m
Elevation: 596.303 m
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0040
Dielec Const: 15.0
Refractivity: 310.0
Receiver Ht AG: 9.1 m
Time Variability: 10.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast



WAUS
Latitude: 41-57-42 N
Longitude: 086-21-02 W
Power: 50.00 kW
Frequency: 90.7 MHz
Channel: 214
AMSL Height: 366 m
Elevation: 200.99 m
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0040
Dielec Const: 15.0
Refractivity: 310.0
Receiver Ht AG: 9.1 m
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

LPFM
Latitude: 42-25-15 N
Longitude: 086-15-37 W
Power: 1.00 kW
Frequency: 90.3 MHz
Channel: 212
AMSL Height: 254 m
Elevation: 196.424 m
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0040
Dielec Const: 15.0
Refractivity: 310.0
Receiver Ht AG: 9.1 m
Time Variability: 10.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast



Attachment B

Declaration:

I, Doug Vernier, declare that I have received training as an engineer from the University of Michigan School of Engineering. That, I have received degrees from the University in the field of Broadcast Telecommunications. That, I have been active in broadcast consulting for over 25 years;

That, I have held a Federal Communications Commission First Class Radiotelephone License continually since 1964. In 1985, this license was reissued by the Commission as a lifetime General Radiotelephone license no. PG-16-16464;

That, I am certified as a Professional Broadcast Engineer (#50258) by the Society of Broadcast Engineers, Indianapolis, Indiana. (Re-certified 11/95.)

That, my qualifications are a matter of record with the Federal Communications Commission;

That, I have been retained by the Adventist Radio Network, Inc., and as such have prepared the engineering showings appended hereto;

That, I have prepared these engineering showings, the technical information contained in same and the facts stated within are true of my knowledge;

That, under penalty of perjury, I declare that the foregoing is correct.

Douglas L. Vernier

Executed on July 26, 1999

Subscribed and sworn before me this 26th day of July, 1999.

Notary Public in and for the State of Iowa

My Commission Expires August 10, 2001

APPENDIX B

Members of the Adventist Radio Network, Inc. include the following:

Adventist Broadcasting Service, Inc.: KSDA-FM, Agat, Guam.
Andrews Broadcasting Corporation: WAUS, Berrien Springs, Michigan
Chehalis Valley Educational Foundation: KACS, Chehalis, Washington.
Columbia Union College Broadcasting, Inc.: WGTS, Takoma Park, Maryland.
Cumberland Communication Corporation: WSGM, Coalmont, Tennessee.
Family First: WBAJ(AM)[1], Blythewood, South Carolina.
Good News Radio: KSGN, Riverside, California.
Growing Christian Foundation; KPLW, Wenatchee, Washington; KYPL, Yakima, Washington.
Harvest Broadcasting Company: KARM, Visalia, California.
Howell Mountain Broadcasting Company: KNDL, Angwin, California.
LifeTalk Broadcasting Association: KLRF[2], Milton-Freewater, Oregon; KLRO, Nile, Washington; KSCH, Ellensburg, Washington; KSOH, Wapato, Washington; KSVA(AM), Albuquerque, New Mexico; KUDU, Tok, Alaska; KWLR[3], Maumelle, Arkansas; WJYC, Delhi Hills, Ohio; WSOH, New Washington, Indiana.
Modesto Adventist Academy: KADV, Modesto, California.
Oakwood College: WOCG, Huntsville, Alabama.
Rural Life Foundation, Inc.: WDNX, Olive Hill, Tennessee.
Southern Adventist University: WSMC, Collegedale, Tennessee.
Southern Idaho Corporation of Seventh-day Adventists: KTSY, Caldwell, Idaho.
Southwestern Adventist University: KJCR, Keene, Texas.
Upper Columbia Media Association: KEEH, Spokane, Washington.
Walla Walla College: KGTS, College Place, Washington.

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[1]Associate member.

[2]Unbuilt construction permit.

[3]Operated pursuant to an LMA.